

Astronomy 490
Cornell University
Fall 1986
Carl Sagan

FINAL EXAM

Do both parts 1 and 2, and submit papers to Room 307, Space Sciences Building, no later than 3 p.m., Friday, December 19, 1986.

Part 1

In light of our course's readings and discussions, comment on both the pros and the cons of the following statement by George Bernard Shaw (from the Preface to his St. Joan, written around 1921):

Our credulity, though enormous, is not boundless; and our stock of it is quite used up by our mediums, clairvoyants, hand readers, slate writers, Christian Scientists, psychoanalysts, electronic vibration diviners, therapists of all schools registered and unregistered, astrologers, astronomers who tell us that the sun is nearly a hundred million miles away and that Betelgeuse is ten times as big as the whole universe, physicists who balance Betelgeuse by describing the incredible smallness of the atom, and a host of other marvel mongers whose credulity would have dissolved the Middle Ages in a roar of sceptical merriment. In the Middle Ages people believed that the earth was flat, for which they had at least the evidence of their senses: we believe it to be round, not because as many as one per cent of us could give the physical reasons for so quaint a belief, but because modern science has convinced us that nothing that is obvious is true, and that everything that is magical, improbable, extraordinary, gigantic, microscopic, heartless, or outrageous is scientific.

Preferred length: 5-10 pages.

Part 2

Sun sign astrology is the variety you can find in your daily newspaper (for help in seeking reference material, prominent advocates include Linda Goodman and Sydney Omar). It has many practitioners and millions of believers in the United States alone. In contrast, below is a short critical discussion from a recent edition of the Encyclopaedia Britannica. Considering our course's readings and discussions (including Darryl Bem's and James Randi's description of a "cold read"), design and execute an experimental test of sun sign astrology. (You may also add whatever theoretical or logical arguments you think appropriate.) This question is intended as an exercise in critical thinking, not a regurgitation of any "correct" answer. If you conclude that the evidence for sun sign astrology is poor, offer an explanation for its popularity. If you conclude that the evidence is fair (or good or excellent), offer an explanation of the scholarly disdain that the subject evokes (as in the E.B. article below):

Astrology today. Newtonian physics eradicated a belief in astrology among the educated. The practice of the now pseudoscience continued among nonintellectuals in the West, gradually losing contact with its rich tradition and becoming more and more fraudulent, though in countries such as India, where only a small intellectual elite has been trained in Western physics, it manages to retain here and there its position among the sciences. Regardless of its validity, some Indian universities offer advanced degrees in astrology.

Recently in the West, however, astrology has regained a large popular following, though there does not seem to have been any effort made to reestablish a firm theoretical basis for it. The divisions of the year governed by the 12 zodiacal signs (which are derived from Hellenistic astrology) as depicted in newspapers, manuals, and almanacs are as follows:

Aries, the Ram,
March 21-April 19
Taurus, the Bull,
April 20-May 20
Gemini, the Twins,
May 21-June 21
Cancer, the Crab,
June 22-July 22

Libra, the Balance,
September 23-October 23
Scorpio, the Scorpion,
October 24-November 21
Sagittarius, the Archer,
November 22-December 21
Capricorn, the Goat,
December 22-January 19

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Leo, the Lion,
July 23-August 22
Virgo, the Virgin,
August 23-September 22

Aquarius, the Water Carrier,
January 20-February 18
Pisces, the Fish,
February 19-March 20

Attempts have been made to incorporate into the general astrological scheme the planets discovered since the Renaissance and to find statistical relations between planetary positions and human lives. None of these attempts appear to be at all convincing, however, and no serious explanation seems to exist regarding the alleged spheres of their influences, or the manner in which they are received. Nor has any modern astrologer proved that arbitrary arcs (houses or zodiacal signs) on a nonexistent circle (the ecliptic) are endowed with existence and with attributes, much less with the power to affect human lives. Moreover, since the phenomena of this world are now largely explainable by the hypotheses of modern science, it is difficult to understand how astrological influences can also be responsible for them. In short, modern Western astrology, though of great interest sociologically and popularly, generally is regarded as devoid of intellectual value.

The paper may be written by groups of students in this class, up to 4 people, but for grading purposes the quality of the paper must be at least proportional to the number of students (i.e. a "B" will be given to a paper written by 2 students provided it is twice as good as a "B" paper written by only one student, etc.). Be as terse as possible for what you have to say (but not terser).